

# Bluehead Sucker

## Species Conservation Assessment Update

**Title of Assessment:** Bluehead Sucker (*Catostomus discobolus*): A Technical Conservation Assessment, USDA Forest Service, Rocky Mountain Region

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**Update Author:** Gary P. Beauvais

**Date of Update:** July 1, 2006 - September 1, 2006

### Update Summary

**Distribution:** Recent information does not suggest a substantial change in the range of the bluehead sucker. There appears to be sufficient fish sampling and monitoring within the species' range to detect such changes when and if they occur.

**Taxonomic Status:** Taxonomic status of bluehead sucker remains unchanged.

**Agency Status:** The Zuni subspecies of bluehead sucker (*Catostomus discobolus yarrowi*; does not occur in Region 2) is now considered a Candidate for listing under the U.S. Endangered Species Act (source 5). The full species is considered a conservation priority in the Wyoming Comprehensive Wildlife Conservation Strategy (source 16). There appears to be a continuing interest in native Colorado River fishes as general conservation targets (sources 4, 7, 9, and 15).

**Other:** Sources 10 and 13 offer recommendations on more effective population and habitat monitoring procedures.

**Significance of Changes Relative to Original Assessment:** A full update of the Technical Conservation Assessment does not appear necessary at this time, since the conservation and management context of bluehead sucker has remained unchanged, and there has been little increase in ecological knowledge of the species since the original assessment was published.

## Positive Findings of New or Updated Information and Their Sources

(Note: The Table A checklist attached to this update provides a summary of all sources consulted)

### Source 1

Badame, P.V., H.J. Michael, and J.A. Julie. 2004. Population trends and distributions of flannelmouth sucker (*Catostomus latipinnis*) and bluehead sucker (*Catostomus discobolus*) in the lower Green River, 2001-2003. Utah Division of Wildlife Resources. Moab, Utah, USA.

### Summary of New Information

This source was not acquired or reviewed. It is listed here to alert future Species Conservation Assessment authors of its existence and potential relevance.

### Relevant Sections of the Conservation Assessment Affected by the Updates

NA

## Source 2

Beatty, R.J. 2005. Catostomid spawning migrations and late-summer fish assemblages in lower Muddy Creek, an intermittent watershed in southern Carbon County, Wyoming. MS Thesis, University of Wyoming. Laramie, Wyoming, USA.

### ***Summary of New Information***

Catostomid spawning migrations in Muddy Creek, a periodically-intermittent stream in south-central Wyoming, probably vary greatly with water discharge pattern, water temperature, stream intermittency, and position of movement barriers. Bluehead suckers, flannelmouth suckers (*Catostomus latipinnis*), and non-native white suckers (*C. commersoni*) have all been known to ascend Muddy Creek to spawn in the past. This study, performed during a prolonged and severe dry spell, documented only white suckers doing so, and only below a wetland impoundment. Although conditions appeared suitable for spawning by both white and flannelmouth suckers, water temperature and flow may have been too low for spawning by bluehead suckers. Various barriers to fish movement, such as wetland impoundments, small dams, and headgates, separated distinct fish communities in the upper, middle, and lower sections of Muddy Creek; see source 3. Several *Catostomus* hybrids were documented during this study.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Activity pattern, Habitat, Breeding biology, Threats, and Potential Management of the Bluehead Sucker in Region 2

## Source 3

Bower, M.R. 2005. Distributions and habitat associations of bluehead suckers, flannelmouth suckers, and roundtail chubs in the upper Muddy Creek Watershed of southern Carbon County, Wyoming. MS Thesis, University of Wyoming. Laramie, Wyoming, USA.

### ***Summary of New Information***

Bluehead suckers, flannelmouth suckers (*Catostomus latipinnis*), and non-native white suckers (*C. commersoni*) were widely distributed along Muddy Creek, a periodically-intermittent stream in south-central Wyoming. Hybrids of native and non-native suckers were also commonly observed. Bluehead suckers were most strongly associated with rock substrates, frequent pool-riffle sequences including deep pools, and perennial stream flows. Instream structures that prevent or impede movement of suckers may reduce population viability. This topic, along with the competitive and hybridization effects of non-native fish, should be a top research priority. See source 2.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Management status and natural history, Biology and Ecology, Activity pattern, Habitat, Breeding biology, Threats, and Potential Management of the Bluehead Sucker in Region 2

## Source 4

Federal Register. 2004. Reservoir operations to benefit Endangered fishes in the Gunnison and Colorado Rivers, Aspinall Unit, Colorado River storage project, Colorado. Federal Register 69: 2943-2945.

### ***Summary of New Information***

This source establishes hydrological flow recommendations from the USDI Bureau of Reclamation, in cooperation with the USDI Fish and Wildlife Service, pertinent to a section of the Gunnison River in western Colorado. These recommendations are intended to benefit the 4 species of native Colorado River fish listed under the Endangered Species Act. Although the bluehead sucker is not one of the species targeted by these actions, this source is pertinent to the bluehead sucker in that it signals a strong desire to manage river systems to benefit native fish. The flow recommendations

outlined here will likely benefit the bluehead sucker inasmuch as they return the system to a more natural flow regime. See sources 7 and 11.

***Relevant Sections of the Conservation Assessment Affected by the Updates***

Existing Regulatory Mechanisms, Mgmt Plans, and Conservation Strategies, and Potential Management of the Bluehead Sucker in Region 2

**Source 5**

Federal Register. 2005. Endangered and Threatened wildlife and plants; review of native species that are candidates or proposed for listing as Endangered or Threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions; proposed rule. Federal Register 70:24869-24934.

***Summary of New Information***

The USDI Fish and Wildlife Service considers several species as candidates for listing under the U.S. Endangered Species Act, including a subspecies of the bluehead sucker, the Zuni bluehead sucker (*Catostomus dicobolus yarrowi*). This subspecies does not occupy USFS Region 2; it occurs in an isolated section of stream in New Mexico. This source indicates that there is some potential for the listing of unique subspecies, possibly extending to distinct population segments as well, of the overall species *C. discobolus*. See source 6.

***Relevant Sections of the Conservation Assessment Affected by the Updates***

Management Status , Existing Regulatory Mechanisms, Mgmt Plans, and Conservation Strategies, Conservation Status of the Bluehead Sucker in Region 2, Potential Management of the Bluehead Sucker in Region 2

**Source 6**

Federal Register. 2006a. Endangered and Threatened wildlife and plants; initiation of 5-year reviews of 56 species in California and Nevada. Federal Register 71:14538-14542.

***Summary of New Information***

The USDI Fish and Wildlife Service is conducting a 5-year review of the status and scientific knowledge pertaining to 56 California species listed under the U.S. Endangered Species Act, including the Endangered Modoc sucker (*Catostomus microps*). The source is only distantly pertinent to the bluehead sucker in that it demonstrates extreme conservation concern and action being applied to a related species in the same genus. See source 5.

***Relevant Sections of the Conservation Assessment Affected by the Updates***

Management Status, Existing Regulatory Mechanisms, Mgmt Plans, and Conservation Strategies

**Source 7**

Federal Register. 2006b. Endangered and Threatened wildlife and plants; 12-month finding on a petition to list a distinct population segment of the roundtail chub in the Lower Colorado river basin and to list the headwater chub as Endangered or Threatened with critical habitat. Federal Register 71:26007-26017.

***Summary of New Information***

The USDI Fish and Wildlife Service (1) rejects the listing of a distinct population segment of the roundtail chub (*Gila robusta*) (occurring in the lower Colorado River Basin) under the U.S. Endangered Species Act and (2) finds the listing of the headwater chub (*G. nigra*) (occurring in the same general area) under the U.S. Endangered Species Act is warranted, but precluded by higher priority actions. Although not directly related to the bluehead sucker, this source is part of a suite of federal documents indicating conservation concern and action being applied to native fish that share range with the bluehead sucker. See source 4.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Existing Regulatory Mechanisms, Mgmt Plans, and Conservation Strategies, and Potential Management of the Bluehead Sucker in Region 2

#### **Source 8**

Gido, K.B., N.R. Franssen, and D.L. Propst. 2006. Spatial variation in d15N and d13C isotopes in the San Juan River, New Mexico and Utah: implications for the conservation of native fishes. *Environmental Biology of Fishes* 75:197–207.

#### ***Summary of New Information***

Analyses of stable isotopes of carbon and nitrogen in fish bodies revealed that juvenile bluehead suckers are primarily herbivores/ detritivores in the San Juan River near the junction of Colorado, New Mexico, Utah, and Arizona. This is consistent with previous analyses of food habits of this species. The trophic web in this river is based mostly on detritus (as opposed to in-stream productivity); most fish fed on detritivorous chironomids in low velocity habitats. Trophic position of all fish depended somewhat on channel type (primary or secondary), suggesting that stream and fish managers need to consider the 2 types as distinct ecological and management environments.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Biology and Ecology, Habitat, Food habits, Community ecology

#### **Source 9**

Kern, A., R. Keith, and K. Gelwicks. 2006. Progress Report, Green River watershed native non-game species research: phase 2. Wyoming Game and Fish Department. Green River, Wyoming, USA.

#### ***Summary of New Information***

The Wyoming Game and Fish Department has been conducting, and continues to conduct, fish surveys to better distinguish the distribution of native non-game fish, including the bluehead sucker, in the Green River watershed of Wyoming. This source provides precise and very recent distributional information for bluehead sucker in Wyoming, and also documents likely hybridization between bluehead sucker and the non-native white sucker (*Catostomus commersoni*). Importantly, this source is the latest in a series of sources that detail earlier project phases. These earlier sources are cited, and should be reviewed and incorporated as appropriate into the updated Species Conservation Assessment.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Biology and Ecology, Distribution and abundance, Population trend, Habitat, Community ecology, Threats, Conservation Status of the Bluehead Sucker in Region 2, Potential Management of the Bluehead Sucker in Region 2

#### **Source 10**

Paukert, C.P. 2004. Comparison of electrofishing and trammel netting variability for sampling native fishes. *Journal of Fish Biology* 65:1643–1652.

#### ***Summary of New Information***

Trammel netting and electrofishing were used to sample populations of 3 Colorado River fish, including bluehead sucker. Capture data were evaluated in order to assess each technique's potential for generating reliable population trend estimates for each fish species. The amount of sampling effort necessary for either trammel netting or electrofishing to produce the catch-per-unit-effort data needed for population trend estimation was prohibitively high. Trend estimation and monitoring of rare Colorado River fish is probably best pursued via mark-recapture methods.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Potential Management of the Bluehead Sucker in Region 2, Information Needs

#### **Source 11**

Propst, D.L. and K.B. Gido. 2004. Responses of native and nonnative fishes to natural flow regime mimicry in the San Juan River. *Transactions of the American Fisheries Society* 133:922-931.

#### ***Summary of New Information***

Beginning in 1993 reservoir discharges on the San Juan River (near junction of Colorado, New Mexico, Arizona, and Utah) were regulated to mimic a more natural flow regime (i.e., high spring runoff). Autumn densities of several native fish, including bluehead sucker, increased with elevated spring discharge. Total native fish density was 10 times greater in 1993 (the year of highest spring discharge) than in 2000 (the year of lowest spring discharge). The density of only 1 nonnative fish (western mosquitofish; *Gambusia affinis*) was significantly negatively related to spring discharge. Sustained low summer flows increased the density of many nonnative fish. Manipulating spring discharge to mimic a natural flow regime enhances native fish recruitment, but might have limited effect in suppressing nonnative species. See source 4.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Existing Regulatory Mechanisms, Mgmt plans, and Conservation Strategies, Biology and Ecology, Habitat, Community ecology, Potential Management of the Bluehead Sucker in Region 2

#### **Source 12**

Quist, M.C., M.R. Bower, and W.A. Hubert. 2006a. Summer food habits and trophic overlap of roundtail chub and creek chub in Muddy Creek, Wyoming. *Southwestern Naturalist* 51:22–27.

#### ***Summary of New Information***

Interactions between nonnative creek chub (*Semotilus atromaculatus*) and 3 native species, bluehead sucker, flannelmouth sucker (*Catostomus latipinnis*), and roundtail chub (*Gila robusta*), were studied in Muddy Creek, southern Wyoming. Creek chubs compete directly with roundtail chubs for food. Creek chubs were also found to prey on bluehead sucker.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Biology and Ecology, Food habits, Community ecology, Threats, Potential Management of the Bluehead Sucker in Region 2

#### **Source 13**

Quist, M.C., W.A. Hubert, M. Fowden, S.W. Wolff, and M.R. Bower. 2006b. The Wyoming Habitat Assessment Methodology (WHAM): a systematic approach to evaluating watershed conditions and stream habitat. *Fisheries* 31:75-81.

#### ***Summary of New Information***

The Wyoming Game and Fish Department is currently using a procedure termed the “Wyoming Habitat Assessment Methodology” (WHAM) to evaluate fish habitats and assemblages throughout the state. The main feature of this procedure is that it integrates habitat characteristics at multiple scales: watershed, stream reach, and project-level (or “site-specific”). Progressing levels of assessment depend on previous levels. An example of the procedure, focusing on bluehead sucker, is provided. This example results in a decision tree that is used to predict the occurrence of bluehead sucker based on habitat and biogeographic characteristics.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Biology and Ecology, Habitat, Potential Management of the Bluehead Sucker in Region 2, Information Needs

## **Source 14**

Stewart, G., R. Anderson, and E. Wohl. 2005. Two-dimensional modelling of habitat suitability as a function of discharge on two Colorado rivers. *River Research and Applications* 21:1061-1074.

### ***Summary of New Information***

This source develops models that estimate the adult biomass of bluehead suckers and flannelmouth suckers (*Catostomus latipinnis*) on the Colorado and Yampa Rivers, Colorado, from stream depth and velocity. Adult biomass of both species correlated strongly and positively with depth and velocity. Results suggest that each river has similar potential for native fish biomass, but low summer discharges limit native fish biomass on the Yampa River.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Biology and Ecology, Habitat, Potential Management of the Bluehead Sucker in Region 2, Information Needs

## **Source 15**

Trammel, M., S. Meismer, and D. Speas. 2004. Nonnative cyprinid removal in the lower Green and Colorado rivers, Utah. Utah Division of Wildlife Resources Publication #05-10. Salt Lake City, Utah, USA.

### ***Summary of New Information***

The Utah Division of Wildlife Resources removed non-native cyprinids along a 50-mile stretch of the Green River, and 3 disjunct 10-mile stretches of the Colorado River, in an attempt to increase habitat quality for native fishes. The removal data was analyzed to assess the effectiveness of the removal protocols. Removal reduced densities of non-native cyprinids only temporarily and only at very local scales; the ubiquity, abundance, and reproductive potential of these fishes made it extremely difficult to effect long-term or widespread reductions. Removal efforts did not change fish species assemblages at any detectable level. Removal of non-native fishes should still be pursued, but with different methods and with careful consideration of appropriate experimental controls that allow accurate evaluation of method effectiveness.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Biology and Ecology, Community ecology, Threats, Potential Management of the Bluehead Sucker in Region 2, Information Needs

## **Source 16**

Wyoming Game and Fish Department. 2005. A comprehensive wildlife conservation strategy for Wyoming. Wyoming Game and Fish Department. Cheyenne, Wyoming, USA.

### ***Summary of New Information***

This document is the Comprehensive Wildlife Conservation Strategy for the state of Wyoming. Its intent is to serve as a central “hub” for all existing and future management plans and conservation strategies in Wyoming, and to guide the combined efforts of government agencies at all levels, non-profits, academia, non-governmental organizations, tribes, and individuals to conserve all Wyoming wildlife. Bluehead sucker (*Catostomus discobolus*) is identified as one of Wyoming’s species of greatest conservation need, and as such are described in this plan as to their distribution, status, habitat use, threats, and likely responses to particular management actions. This source provides some habitat and non-habitat management recommendations for bluehead suckers.

### ***Relevant Sections of the Conservation Assessment Affected by the Updates***

Existing Regulatory Mechanisms, Mgmt Plans, and Conservation Strategies, Biology and Ecology, Distribution and abundance, Population trend, Habitat, Threats, Conservation Status of the Swift Fox in Region 2, Management of the Swift Fox in Region 2

## Source 17

Personal communications with individual biologists and land managers in Region 2 regarding bluehead sucker ecology, management, and conservation.

**Doug Keinath (Lead Zoologist, Wyoming Natural Diversity Database - University of Wyoming; dkeinath@uwyo.edu; 307 766-3023).** The Wyoming Natural Diversity Database is currently working with the Wyoming Game and Fish Department to compile a complete set of all known bluehead sucker sightings in the state. Preliminary indications are that there has been no substantial range expansion or contraction in the state relative to previous distribution maps for this species. This dataset will be available upon request.

**Mary Read (USDI Bureau of Land Management Rawlins Field Office; mary\_read@blm.gov).** MR identified Patrick Lionberger as the new fisheries biologist in the Rawlins FO. He is the best contact for new information regarding bluehead sucker.

**Lisa Belmonte (USDI Bureau of Land Management White River Field Office).** The Aquatic Resources Section of the Colorado Division of Wildlife (NW Region, Grand Junction, CO) may still be collecting relevant fish data for the “White River - Taylor Draw Project”. Also, the USDI Fish and Wildlife Service continues to collect fisheries data from the White River. Best contact information = Colorado River Recovery Program, 764 Horizon Dr., South Annex A, Grand Junction, CO, 81506; phone 970 245-3920.

### **Additional Unabstracted Sources – *pre*-Assessment**

**(citations pre-dating Assessment publication that were not referenced in it).**

None.

### **Additional Unabstracted Sources – *post*-Assessment**

**(citations post-dating Assessment publication that refer to the target genus but were determined by the reviewer to contain no information requiring an update of the original assessment)**

Badame, P.V., H.J. Michael, and J.A. Julie. 2004. Population trends and distributions of flannemouth sucker (*Catostomus latipinnis*) and bluehead sucker (*Catostomus discobolus*) in the lower Green River, 2001-2003. Utah Division of Wildlife Resources. Moab, Utah, USA.

Beatty, R.J. 2005. Catostomid spawning migrations and late-summer fish assemblages in lower Muddy Creek, an intermittent watershed in southern Carbon County, Wyoming. MS Thesis, University of Wyoming. Laramie, Wyoming, USA.

Bower, M.R. 2005. Distributions and habitat associations of bluehead suckers, flannemouth suckers, and roundtail chubs in the upper Muddy Creek Watershed of southern Carbon County, Wyoming. MS Thesis, University of Wyoming. Laramie, Wyoming, USA.

Federal Register. 2004. Reservoir operations to benefit Endangered fishes in the Gunnison and Colorado Rivers, Aspinall Unit, Colorado River storage project, Colorado. Federal Register 69:2943-2945.

Federal Register. 2005. Endangered and Threatened wildlife and plants; review of native species that are candidates or proposed for listing as Endangered or Threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions; proposed rule. Federal Register 70:24869-24934.

Federal Register. 2006a. Endangered and Threatened wildlife and plants; initiation of 5-year reviews of 56 species in California and Nevada. Federal Register 71:14538-14542.

- Federal Register. 2006b. Endangered and Threatened wildlife and plants; 12-month finding on a petition to list a distinct population segment of the roundtail chub in the Lower Colorado river basin and to list the headwater chub as Endangered or Threatened with critical habitat. Federal Register 71:26007-26017.
- Gido, K.B., N.R. Franssen, and D.L. Propst. 2006. Spatial variation in d15N and d13C isotopes in the San Juan River, New Mexico and Utah: implications for the conservation of native fishes. *Environmental Biology of Fishes* 75:197–207.
- Kern, A., R. Keith, and K. Gelwicks. 2006. Progress Report, Green River watershed native non-game species research: phase 2. Wyoming Game and Fish Department. Green River, Wyoming, USA.
- Paukert, C.P. 2004. Comparison of electrofishing and trammel netting variability for sampling native fishes. *Journal of Fish Biology* 65:1643–1652.
- Propst, D.L. and K.B. Gido. 2004. Responses of native and nonnative fishes to natural flow regime mimicry in the San Juan River. *Transactions of the American Fisheries Society* 133:922–931.
- Quist, M.C., M.R. Bower, and W.A. Hubert. 2006a. Summer food habits and trophic overlap of roundtail chub and creek chub in Muddy Creek, Wyoming. *Southwestern Naturalist* 51: 22–27.
- Quist, M.C., W.A. Hubert, M. Fowden, S.W. Wolff, and M.R. Bower. 2006b. The Wyoming Habitat Assessment Methodology (WHAM): a systematic approach to evaluating watershed conditions and stream habitat. *Fisheries* 31:75-81.
- Stewart, G., R. Anderson, and E. Wohl. 2005. Two-dimensional modelling of habitat suitability as a function of discharge on two Colorado rivers. *River Research and Applications* 21:1061-1074.
- Trammel, M., S. Meismer, and D. Speas. 2004. Nonnative cyprinid removal in the lower Green and Colorado rivers, Utah. Utah Division of Wildlife Resources Publication #05-10. Salt Lake City, Utah, USA.



## **Checklist of Sources Consulted for Updates to the Bluehead Sucker Conservation Assessment**

### **Guidelines for Producing Updates**

Sources of information relevant to review of this Technical Conservation Assessment for updates include databases, experts, personal communications, published and unpublished literature. Positive results are discussed in detail in the Summary of Addendum to the Technical Conservation Assessment.

Internet Literature Searches: The minimal search for each update consists of Google Scholar, Federal Register, plus a minimum of three other available online literature databases. Search terms include at a minimum: species common name, genus, and recent synonyms. Other keywords will be used at the discretion of the updater (e.g., passerine, wetland, rodent). Searches will be constrained to the time beginning two years prior to publication of the Technical Conservation Assessment to the present.

Two attempts were made to contact experts and agency personnel.

**Table A.** Sources of information consulted for updates to the Species Conservation Assessment.

| Source Category   | Source/ Name                          | Date         | Results   |
|---|---------------------------------------|--------------|---|
| Announcement from R2 to all FS personnel (including species list) |                                       |              | No global announcement was made. See individual contacts below.   |
| Internet based literature databases                               | Google                                | 20 July 2006 | Basic Google search was not performed due to abundance of irrelevant documents.   |
|   | Google Scholar                        | 20 July 2006 | Unconstrained search on “Bluehead sucker” = <b>317</b> documents; same for “Catostomus discobolus” = <b>190</b> documents. Search on “Bluehead sucker” documents published b/t 2004 - present = <b>17</b> ; same for “Catostomus discobolus” = <b>13</b> ; same for “Bluehead suckers” = <b>19</b> .<br><br><i>7 relevant publications extracted from latter 3 searches</i> |
|   | Federal Register                      | 20 July 2006 | Search terms “Bluehead sucker”, “Bluehead suckers”, “Catostomus discobolus” for volumes 2004 - present.<br><br><i>4 new relevant sources</i>  |
|   | University of Wyoming Library Catalog | 20 July 2006 | Search terms “Bluehead sucker”, “Bluehead suckers”, “Catostomus discobolus” for 2004 - present.<br><br><i>2 new relevant sources</i>  |

| Source Category | Source/ Name                           | Date         | Results  |
|-----------------|--|--------------|--|
|                 | Wildlife and Ecology Studies Worldwide | 20 July 2006 | Search terms “Bluehead sucker”, “Bluehead suckers”, “Catostomus discobolus” for 2004 - present.<br><br><i>0 new relevant sources</i> |
|                 | Scopus                                 | 20 July 2006 | Search terms “Bluehead sucker”, “Bluehead suckers”, “Catostomus discobolus” for 2004 - present.<br><br><i>0 new relevant sources</i> |
|                 | Web of Science                         | 20 July 2006 | Search terms “Bluehead sucker”, “Bluehead suckers”, “Catostomus discobolus” for 2004 - present.<br><br><i>0 new relevant sources</i> |
|                 | Agricola                               | 20 July 2006 | Search terms “Bluehead sucker”, “Bluehead suckers”, “Catostomus discobolus” for 2004 - present.<br><br><i>0 new relevant sources</i> |
|                 | Biological Abstracts                   | 20 July 2006 | Search terms “Bluehead sucker”, “Bluehead suckers”, “Catostomus discobolus” for 2004 - present.<br><br><i>0 new relevant sources</i> |
|                 | WorldCat                               | 20 July 2006 | Search terms “Bluehead sucker”, “Bluehead suckers”, “Catostomus discobolus” for 2004 - present.<br><br><i>1 new relevant source</i>  |

| Source Category                                       | Source/ Name   | Date        | Results   |
|---|--|-------------|---|
| NatureServe affiliate program databases and personnel | Wyoming Natural Diversity Database (D. Keinath; dkeinath@uwyo.edu)   | 9 Aug 2006  | <i>DK response summarized and on file</i>                             |
|   | Colorado Natural Heritage Program (J. Sovell; jsovell@lamar.colostate.edu)   | 9 Aug 2006  | JS responded with no new information                                  |
| State Agency Personnel                                | Wyoming Game and Fish Department (Robert Keith; Robert.Keith@wgf.state.wy.us)  | 9 Aug 2006  | RK forwarded email to Aaron Kern, Wyoming Game and Fish Dept.         |
|   | Aaron Kern (Wyoming Game and Fish Department; Aaron.Kern@wgf.state.wy.us)  | 20 Aug 2006 | <i>AK provided 1 new source</i>                                       |
| Federal Agency Personnel                              | USDA Forest Service San Juan NF (Mark Ball; mball@fs.fed.us)   | 9 Aug 2006  | MB responded with no new information; forwarded message to colleagues |
|   | USDI Bureau of Land Management Rawlins FO (Frank Blomquist; frank_blomquist@blm.gov)(Mary Read; mary_read@blm.gov)         | 9 Aug 2006  | <i>MR response summarized and on file</i>                             |
|   | USDI Bureau of Land Management Rock Springs FO (Lorraine Keith@blm.gov)  | 9 Aug 2006  | LK responded with no new information; forwarded message to colleagues |
|   | USDI Bureau of Land Management Kemmerer Field Office (Dale Wondercheck; dale_wondercheck@blm.gov)                          | 9 Aug 2006  | No response   |
|   | USDI Bureau of Land Management Little Snake FO (Desa Ausmus; desa_ausmus@blm.gov) (Tim Novotny; tim_novotny@blm.gov)       | 9 Aug 2006  | No response   |
|   | USDI Bureau of Land Management White River FO (Lisa Belmonte; lisa_belmonte@blm.gov) (Ed Hollwed; edward_hollowed@blm.gov) | 9 Aug 2006  | <i>LB response summarized and on file</i>                             |

| Source Category               | Source/ Name   | Date       | Results   |
|-------------------------------|--|------------|---|
|                               | USDI Bureau of Land Management Grand Junction FO (Brendan Moynahan; <a href="mailto:brendan_moynahan@co.blm.gov">brendan_moynahan@co.blm.gov</a> ) | 9 Aug 2006 | No response   |
|                               | USDI Bureau of Land Management Glenwood Springs FO (Tom Fresques; <a href="mailto:tom_fresques@co.blm.gov">tom_fresques@co.blm.gov</a> )           | 9 Aug 2006 | No response   |
|                               | USDI Bureau of Land Management Uncompahgre (Jim Ferguson; <a href="mailto:jim_ferguson@co.blm.gov">jim_ferguson@co.blm.gov</a> )                   | 9 Aug 2006 | No response   |
|                               | USDI Bureau of Land Management Gunnison FO (Sandy Borthwick; <a href="mailto:sandy_borthwick@co.blm.gov">sandy_borthwick@co.blm.gov</a> )          | 9 Aug 2006 | No response   |
|                               | USDI Bureau of Land Management San Juan FO (Mark Ball; <a href="mailto:mball@fs.fed.us">mball@fs.fed.us</a> )                                      | 9 Aug 2006 | MB forwarded message to Dave Gerhardt (Fisheries Biologist, USFS San Juan NF and BLM San Juan FO) |
| Primary experts               |  | --         | None contacted  |
| Museums and Herbaria          |  | --         | No search conducted   |
| Internal USFS Intranet search |  | --         | No search conducted   |
| Original Author               | Jonathan A. Ptacek (Miller Ecological Consultants, Ft. Collins, CO)  | 9 Aug 2006 | No response   |
|                               | David E. Rees (Miller Ecological Consultants, Ft. Collins, CO)   | 9 Aug 2006 | No response   |
|                               | William J. Miller (Miller Ecological Consultants, Ft. Collins, CO)   | 9 Aug 2006 | No response   |
| (Other)                       |  | --         | NA  |

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